

## WATER



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Before the 1991 Gulf War, most Iraqis had access to potable water—95% in urban areas and 75% in rural communities—and most urban areas had sanitation service. Access to clean water and sewerage declined after 1991, as a result of war damage and poor maintenance.<sup>256</sup>

By 2003, Iraq's irrigation network required extensive rehabilitation "after years of insufficient maintenance and funding."<sup>257</sup> A 2003 UN/World Bank assessment estimated that reconstruction for Iraq's water and sewerage systems would cost more than \$6.8 billion,<sup>258</sup> and more than \$1.5 billion for irrigation.<sup>259</sup>

Today, progress in the water sector is impeded by violence, a lack of trained facility workers, and inadequate maintenance practices. In Mosul, approximately 60% of homes and businesses have access to potable water.<sup>260</sup> Although 75% of homes in Basrah have access to raw water, potable water must still be purchased.<sup>261</sup> Although the goal for Baghdad is to provide potable water for all homes and businesses, only 30% are connected to water distribution lines.<sup>262</sup>

Iraq's sewerage system also requires improvement: many cities lack updated sewerage systems and rely on septic systems. In Kirkuk<sup>263</sup> and Samarra,<sup>264</sup> streets and alley-

ways are used for open drainage. In Falluja, raw sewage spills out onto the streets and thus into water sources.<sup>265</sup> In Najaf, 40% of homes are connected to sewage lines,<sup>266</sup> and 50% of homes in Basrah are connected.<sup>267</sup>

This quarter, SIGIR conducted an inspection of the \$4.23 million **Sadr City Al Qana'at Raw Water Pump Station** project, which provides raw water for agricultural uses. This station will also be linked to a potable water plant. SIGIR found no construction deficiencies and determined that the project's quality control and quality assurance mechanisms were operating effectively. For more information on the assessment, see SIGIR Inspections in Section 3.



Al Qana'at Raw Water Pump Station.



## U.S. Support

The water sector has received approximately \$2.38 billion in overall U.S. reconstruction funds.<sup>268</sup> Water projects have received:

- 11.4% of all IRRF 2 funds
- nearly 25% of FY 2006 and FY 2007 CERP funds
- approximately 2% of FY 2006 ESF

For the allocation of funds in this sector, see Figure 2.48.

IRRF 2 has provided \$2.11 billion for water projects,<sup>269</sup> improving access to potable

water, sewerage, and irrigation. As of June 27, 2007, nearly 93% of IRRF 2 funding had been obligated, and 82% for water projects had been expended.<sup>270</sup>

Of the \$944 million in FY 2006 CERP, \$235 million fund water projects.<sup>271</sup> CERP money contributes 10% of the overall funding for the water sector.

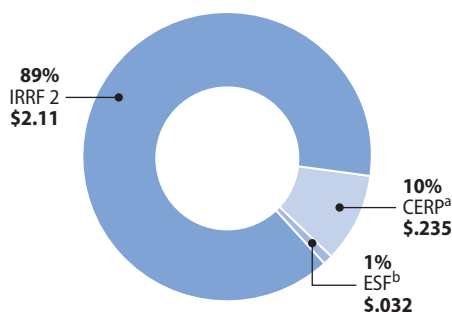
ESF's O&M Sustainment program allocated approximately \$32 million for water.<sup>272</sup> GRD entered into an interagency agreement that fully committed 100% of the \$32 million. GRD reported \$6.29 million in contractual

Figure 2.48

### ALLOCATIONS TO WATER

\$ Billions, % of \$2.38 Billion

Sources: DoS, *Iraq Weekly Status* (6/27/2007); MNC-I, Response to SIGIR (7/7/2007); IRMS, *ESF Economic Track Summary* (7/5/2007)



Note: Numbers are affected by rounding.

a. Allocation detail at the sector and subsector level for CERP is currently unavailable; therefore, the percentages for CERP are calculated using FY 2006 and FY 2007 dollars obligated.

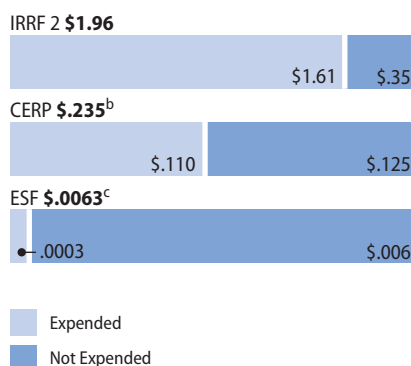
b. FY 2006 Supplemental Funds (P.L. 109-234).

Figure 2.49

### OBLIGATIONS FOR WATER

\$ Billions, \$2.20 Billion Total

Sources: DoS, *Iraq Weekly Status* (6/27/2007); MNC-I, Response to SIGIR (7/7/2007); ITAO, *Weekly Status Report* (6/26/2007); IRMS, *ESF Cost to Complete* (7/5/2007)



Note: Numbers are affected by rounding.

a. By Executive Order, on May 8, 2007, the President created ITAO as the successor organization to the IRMO.

b. FY 2006 and FY 2007.

c. FY 2006 Supplemental Funds (P.L. 109-234).



obligations, of which \$0.32 million has been expended.<sup>273</sup> For the status of funds in this sector, see Figure 2.50.

The ESF Capacity Development and Technical Training program provided an additional \$15 million for water and sanitation projects.

Although progress has been made completing planned water projects, measuring the direct impact of U.S.-funded projects remains a challenge.

## IRRF

As of June 29, 2007, a total of 1,095 IRRF water projects have been undertaken, with about 90% complete, 9% ongoing, and 1% yet to begin.<sup>274</sup> For the status of projects in the water sector, see Figure 2.50.

## Potable Water

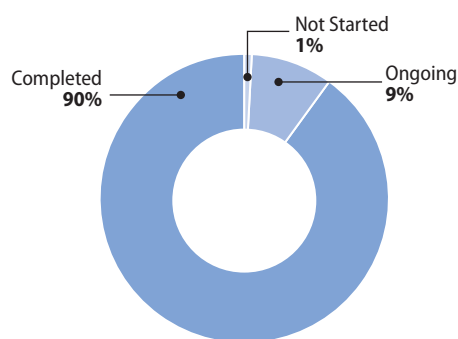
U.S. projects valued at more than \$1.7 billion have provided “capacity for supplying potable water to approximately 2.5 million citizens who previously did not have access.”<sup>275</sup> As of July 1, 2007, potable water projects provided

Figure 2.50

### STATUS OF IRRF 2 PROJECTS - WATER

TOTAL NUMBER OF PROJECTS: 1,095

Sources: IRMS, ITAO\* Rollup (6/29/2007); USAID, Activities Report (7/12/2007)



Note: Numbers are affected by rounding.

\* By Executive Order, on May 8, 2007, the President created ITAO as the successor organization to the IRMO.

Project Type	Not Started	Ongoing	Completed	Total
Potable Water	3	89	901	993
Sewerage	3	9	55	67
Water Conservation			18	18
Pumping Stations and Generators		1	8	9
Other Solid Waste Management			3	3
Umm Qasr/Basrah Water Supply Project		1	1	2
Dam Repair, Rehabilitation and New Construction		1		1
Om Al-Iraq Canal Cleaning			1	1
Construct Eastern Euphrates Drain		1		1
<b>Total</b>	<b>6</b>	<b>102</b>	<b>987</b>	<b>1,095</b>

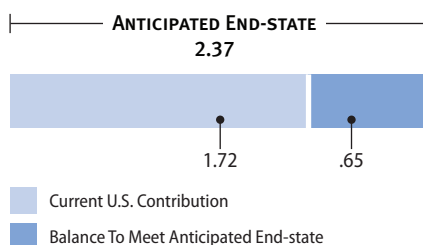


Figure 2.51

## OUTPUT OF U.S. POTABLE WATER PROJECTS

Million Cubic Meters per Day

Source: NEA, Response to SIGIR (7/13/2007)



approximately 1.72 million m<sup>3</sup>/day in additional system capacity, which is nearly 73% of the end-state goal.<sup>276</sup> The outputs of these IRRF-funded projects appear in Figure 2.51 which shows the current and anticipated capacity provided by completed water projects.

The goal of U.S. efforts is to provide potable water to 8.38 million Iraqis.<sup>277</sup> To date, U.S. projects have provided capacity to supply potable water access to an estimated 5.86 million<sup>278</sup> people—an increase from last quarter's 5.6 million and more than half the anticipated end-state. Figure 2.52 shows the additional capacity expected from these IRRF projects.

The United States continues to work to add capacity to the potable water system:

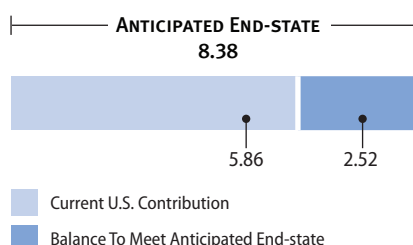
- **Ba'quba Water Treatment Plant Sludge Pump Station** serves 300,000 Iraqis in Diyala province.<sup>279</sup>
- **Two water compact units in Ramadi and one in Salah al-Din province** provide clean, potable water to approximately 41,500 residents.<sup>280</sup>
- **Talha reverse osmosis water treatment plant** in Basrah province serves more than 40,000 residents of the Talha district.<sup>281</sup>

Figure 2.52

## PEOPLE SERVED BY U.S. POTABLE WATER PROJECTS

Millions

Source: NEA, Response to SIGIR (7/13/2007)



- In Kirkuk province, the **Tal Adi Dhahab Water Project** provides water to the city of Jubari, and the **Nassir and Qahara Water Project** supplies water to 1,500 residents.<sup>282</sup>

SIGIR reported in the April 2007 Quarterly Report that the **Nassriya Water Treatment Plant** project (estimated to cost \$276 million) would not be turned over to the Ministry of Municipalities and Public Works until enough Iraqis were trained to operate the facility. As of July, the Ministry had not yet trained a sufficient number of employees to operate the facility.<sup>283</sup> During performance testing in June,<sup>284</sup> the plant produced 2,100 m<sup>3</sup>/hour—only 21% of its 10,000 m<sup>3</sup>/hour capacity.<sup>285</sup>

SIGIR previously has highlighted the **Small Potable Water Program**, which is aimed at boosting potable water capacity in rural areas. Although 41 small water projects have been completed by local Iraqi companies, the target of 87 projects has not yet been achieved because security problems have hindered access to work sites.<sup>286</sup>



Figure 2.53

**OUTPUT OF U.S. SEWERAGE PROJECTS**

Million Cubic Meters per Day

Source: NEA, Response to SIGIR (7/13/2007)

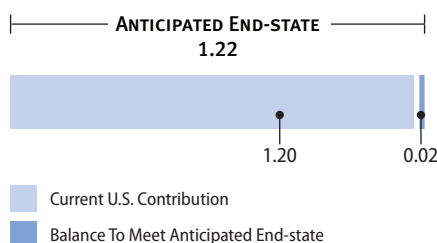
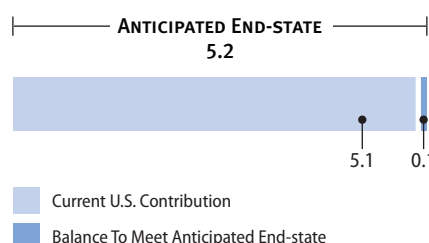


Figure 2.54

**PEOPLE SERVED BY U.S. SEWERAGE PROJECTS**

Millions

Source: NEA, Response to SIGIR (7/13/2007)

**Sewerage**

U.S. projects continue to produce at 1.20 million m<sup>3</sup>/day, which is 2% short of achieving the U.S. goal for additional sewage capacity.<sup>287</sup> Figure 2.53 shows the current and anticipated status of additional sewerage capacity that U.S. projects have contributed to the system.

The United States has now completed 55 of 67 planned sewerage projects (82%).<sup>288</sup> Three projects have yet to begin, and nine are ongoing.<sup>289</sup>

By July 13, 2007, 5.1 million additional people have been served by U.S. funded sewerage projects<sup>290</sup>—100,000 short of the goal. The anticipated end-state for service has been altered slightly since last quarter, which was revised from 5.3 million people to 5.2 million people. Figure 2.54 illustrates the current number of people served, compared with the new goal.

Last quarter, SIGIR noted that work on the **Falluja Wastewater System** was vulnerable because of the unstable security environment. The project, valued at \$49 million, will include a wastewater treatment plant and several pump stations.<sup>291</sup> Although ITAO reports that the

project will serve 228,000 people,<sup>292</sup> GRD estimates that only 75,000 people will be served initially.<sup>293</sup> GRD says that reaching this quarter's construction goal is unlikely because of a "security shutdown and the impact of delayed approval of DFI invoices by GOI."<sup>294</sup>

**Irrigation**

On March 1, 2007, USACE handed construction of the **Nassriya Drainage Pump Station** over to the Ministry of Water Resources, with an estimated completion date of December 31, 2007.<sup>295</sup> Until the March handover, the United States had invested approximately \$80 million in the project.<sup>296</sup>

As part of the transition of responsibility to the Iraqis, GRD and the Ministry signed a grant agreement in June 2007 with \$20 million in IRRF funding, which will partially support the project's remaining work.<sup>297</sup> GRD reported that the agreement "allows the Iraqi Ministry to execute the procurement, administration, construction, management and quality assurance, under the oversight of GRD, for agreed-upon construction projects."<sup>298</sup> The arrangement is "structured such that the Ministry will



The water sector has received approximately \$2.38 billion in U.S. reconstruction funds.

be reimbursed for work completed according to a table of earned values previously agreed upon by both the Ministry and GRD.”<sup>299</sup>

The **Eastern Euphrates Drain Project** is associated with the Nassriya Drainage Pump Station. It is partially funded by a grant agreement with the Ministry of Water Resources. Approximately 9% of the project is complete. The 15% completion target was not achieved because of issues arising from land disagreements.<sup>300</sup>

The anticipated target for additional irrigated or drained land is 387,000 hectares. The United States has reached 8% of that goal.<sup>301</sup> Figure 2.55 illustrates the anticipated end-state and current status of irrigation projects, measured in hectares.

## CERP

CERP FY 2006 and FY 2007 water projects received approximately \$235 million—nearly 10% of the total (\$2.38 billion) reconstruction funds allocated for Iraq’s water sector and 24% of the total FY 2006 and FY 2007 CERP funds (\$944 million).

As IRRF projects finish and IRRF funding is expended, CERP-funded projects are taking on a greater role in the water sector. The Multi-

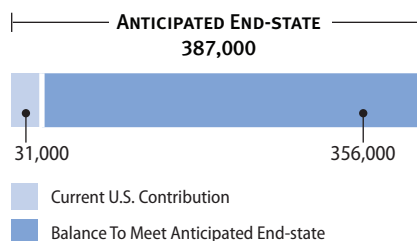
National Corps-Iraq (MNC-I) has undertaken 1,209 water projects with CERP FY 2006 and FY 2007 funds. Over the past three years in Iraq, the average value of CERP water projects has increased from approximately \$90,000 in 2004 to \$260,000 in 2006.

Figure 2.55

### OUTPUT OF U.S. IRRIGATION PROJECTS

Hectares

Source: ITAO,\* *Weekly Status Report* (7/10/2007)



\* By Executive Order, on May 8, 2007, the President created ITAO as the successor organization to the IRMO.



In 2005, a major reprogramming of IRRF dollars shifted money out of the water sector and into non-construction sectors. As a result, CERP FY 2006 and FY 2007 funds have been used to pay for water projects in Iraq. As the maps below show, 12 governorates have experienced a consistent increase in the average value of CERP water projects between 2004 and 2006. Baghdad has experienced the most consistent increase, from \$122,000 in 2004 to approximately \$450,000 in 2006. Anbar, Muthanna, Tameem, Babylon, Diyala, and Salah al-Din provinces also experienced consistent increases.

For the average value of CERP water projects by governorate, see Figure 2.56.

CERP water expenditures fund potable water, sanitary sewage, and storm-water systems projects in Iraq. As of July 7, 2007, CERP FY 2006 and FY 2007 has funded 420 ongoing and 789 completed projects.<sup>302</sup> For the status of CERP water projects, see Figure 2.57.

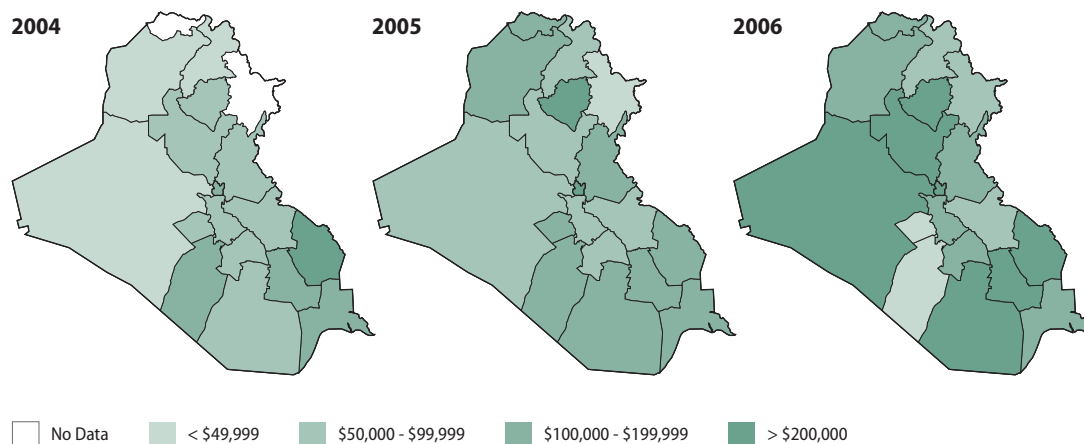
### ESF

As IRRF infrastructure projects near completion, the focus turns to building Iraq's capacity to maintain completed projects. ESF sustainment projects aim to strengthen Iraq's ability to maintain facilities and equipment. ESF is funding a total of 23 projects. None has been completed, nearly 22% are ongoing, and more than 78% have yet to start.<sup>303</sup> Figure 2.58

Figure 2.56

#### AVERAGE VALUE PER CERP WATER PROJECT BY GOVERNORATE

Source: IRMS, CERP Excel Workbook (6/29/2007)



Note:

Data is compiled using FY 2004, FY 2005, and FY 2006 CERP funds. The years indicated correspond to the actual start dates of the projects.





Figure 2.57

## STATUS OF CERP FY 2006 AND FY 2007 PROJECTS WATER AND SANITATION

TOTAL NUMBER OF PROJECTS: 1,209

Source: MNC-I, Response to SIGIR (7/7/2007)

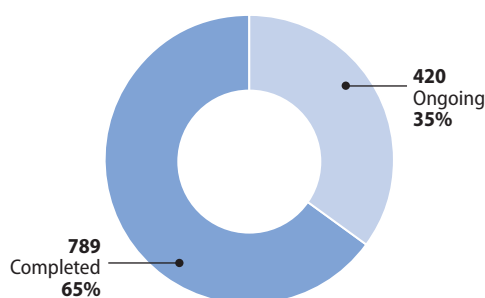
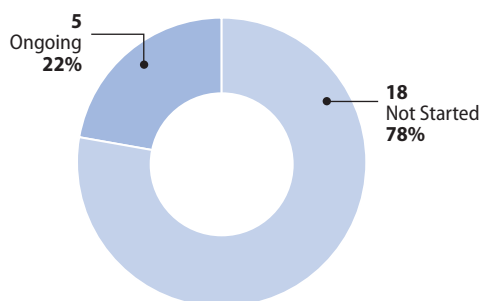


Figure 2.58

## STATUS OF ESF\* PROJECTS - WATER AND SANITATION

TOTAL NUMBER OF PROJECTS: 23

Source: IRMS, ESF Project Tracker (6/29/2007)



\* Funded by the ESF FY 2006 Supplemental.

shows the status of O&M Sustainment projects in the water sector. The ESF-funded Provincial Reconstruction Team (PRT) program also conducts water projects.

### Challenges in Sustainment

The inability of Iraq's water ministries to sustain projects continues to limit progress in the sector. The security situation is the "number one challenge faced by ministries today in executing their work."<sup>304</sup> Deteriorating conditions are "increasingly affecting the ability of both the Ministry of Water Resources and the Ministry of Municipalities and Public Works to operate and has reached a crisis stage."<sup>305</sup> Employees have vacated Baghdad buildings in dangerous locations, and "Ministry of Municipalities and Public Works officials estimate that less than half the remaining staff (those who have not fled the country) are showing up for work every day."<sup>306</sup>

The GOI has not allocated sufficient money for operations and maintenance (O&M); this affects sustainability. Iraqi ministries tend to focus on building facilities rather than maintaining them.<sup>307</sup> For example, O&M was budgeted at 9% of the total funds ITAO recommended to the Ministry of Municipalities and Public Works in 2005 and 2006. Overall, however, the Ministry of Water Resources has adequate capacity to execute capital projects.<sup>308</sup>

Other factors hindering progress in the water sector include the lack of a well-established fee for service and the lack of a strong, customer-oriented focus. Performance could be improved by providing more funding for ministerial capacity development, an improved worker-compensation system, increased transparency and accountability, development of higher-quality services, and improved O&M.<sup>309</sup>

Another issue related to sustainability is the **Water Sector Sustainment Program**





(WSSP), which continues this quarter. Phase II was anticipated to be complete last quarter; GRD reports that Phase II is still ongoing but nearing completion.<sup>310</sup> Phase III is beginning and continues to support the program's emphasis on O&M in water and wastewater

facilities and rural water projects.<sup>311</sup> On June 5, 2007, GRD awarded contracts for O&M support and training programs.<sup>312</sup> Phase III will also add new projects coordinated by ITAO and in conjunction with Iraq's water ministries.<sup>313</sup>

## WATER

